NRL/VXS-1

2010

UPDATE

VXS-1 2009 Milestones

- Iraq deployment in Nov 2008
- Coast Guard MIA flight completed over Greenland
- SOUTHCOM multi-sensor deployment completed in January of 2009
- Magnetic survey completed in June 2009
- NOAA NGS deployment to Alaska completed in July 2009
- Completed project modification on both C-12 aircraft
  - Cargo Pod purchased to support new sensors
- Scan Eagle UAS
  - Ongoing NEO program flights
- XFC UAS
  - ~23 hour endurace
- MZ-3A Airship

Project Modifications for

VXS-1

C-12 Aircraft

C-12 Modifications

Project Power Distribution Box:

115 VAC @ 400HZ, (1X) 10 Amp circuit, and (2X) 5 Amp Circuits

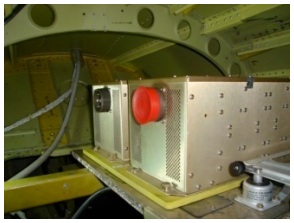
115 VAC @ 60HZ, (1X) 15 Amp circuit, (1X) 10 amp circuit

28 VDC (1X) 10 Amp circuit, (2X) 5 Amp Circuits

GPS Antenna located on the upper fuselage

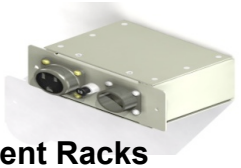
Power Boxes installed in the Aft Electronics Bay

Inverters installed in the wing



Power Box

Starboard Power Distribution Panel



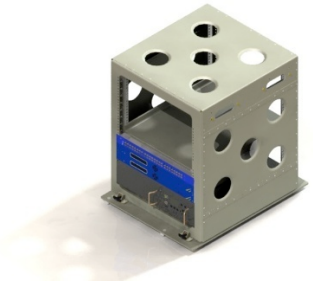
RO/RO Equipment Racks

Rack is 24” deep x 22” wide x 28” tall with standard 19” MX mounting pattern

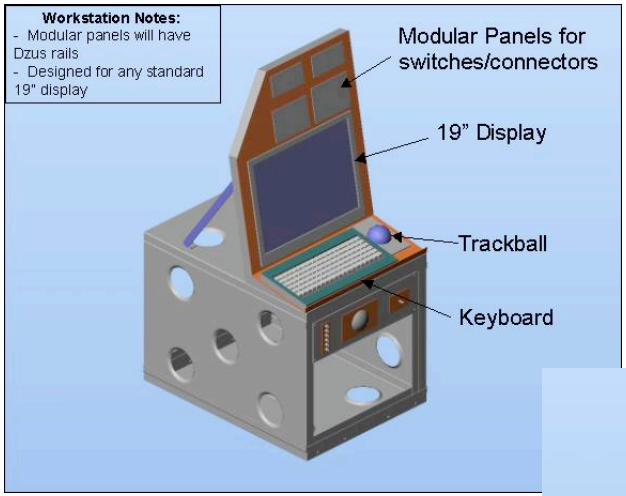
30” deep variation also designed

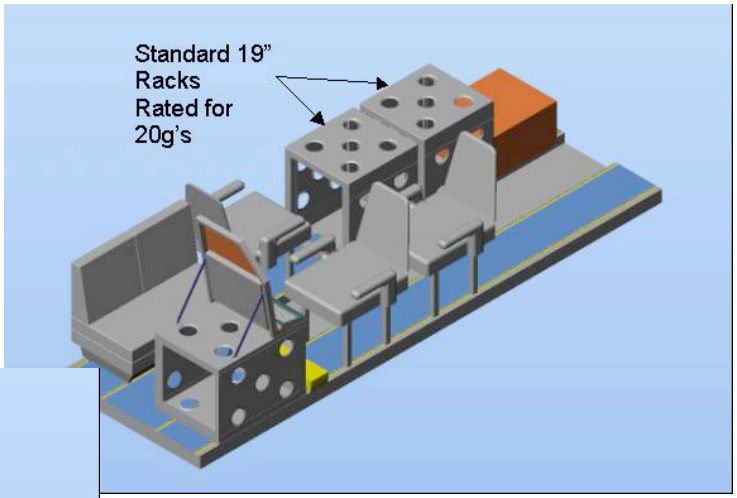
Designed to be lightweight to allow for more equipment, and lower cost

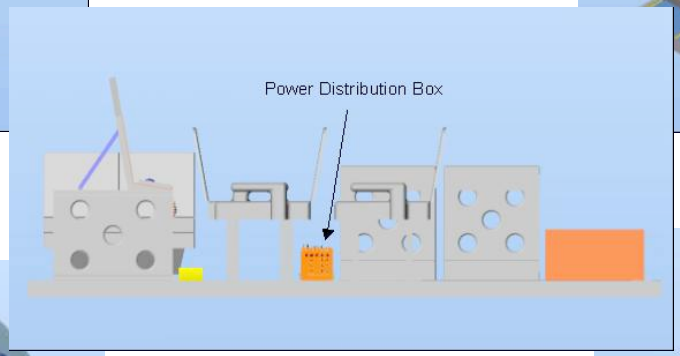
Equipment weight approx 200 Lbs

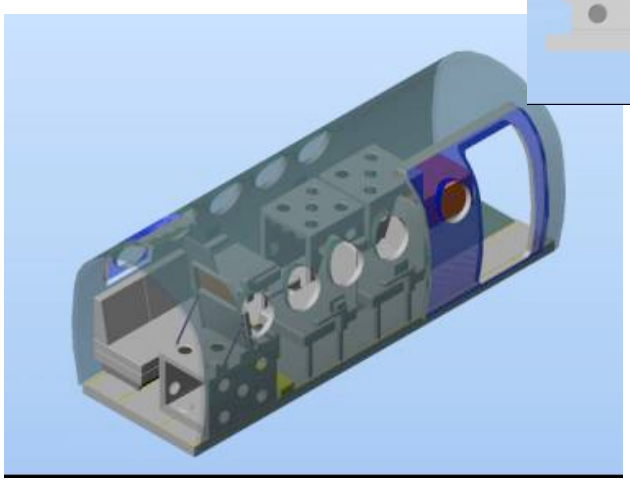


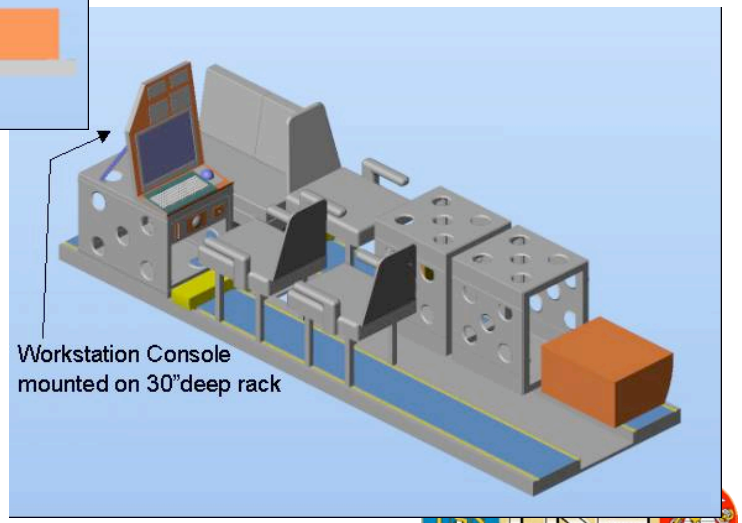
C-12 Internal Rack Configuration











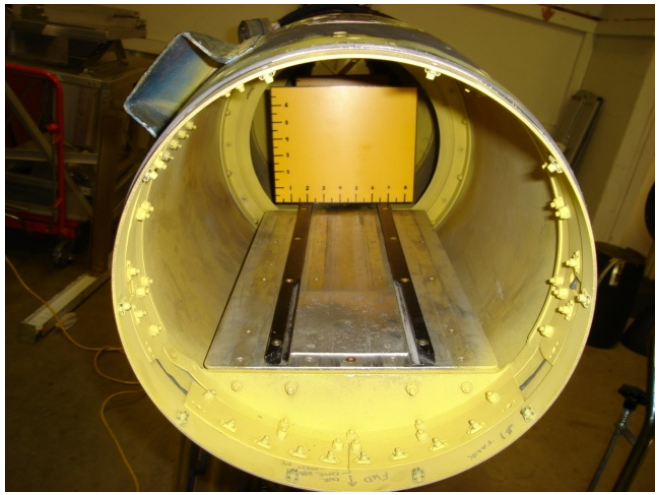
Wing Tip Tanks (in work)

Mount on the wing tips.

Formerly fuel tanks modified to carry electronics.

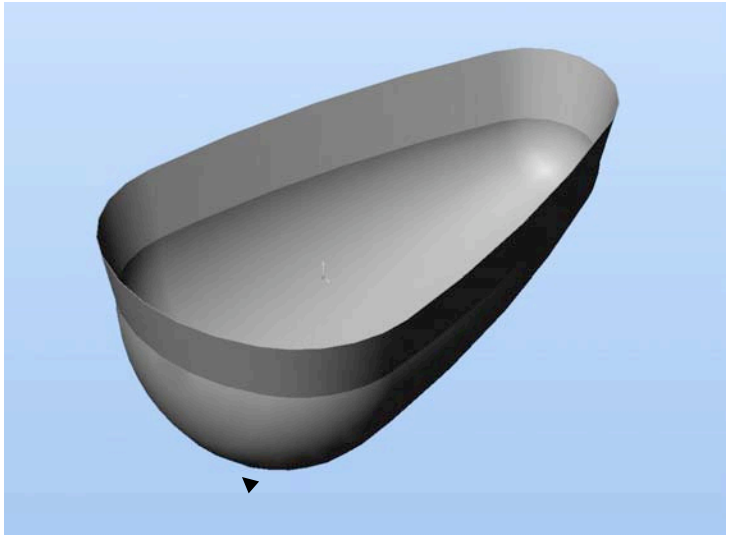
Incorporate a “Rail” system for slide in/slide out (SI/SO) capability.

Electronic equipment can be mounted to a blank plate which allows for SI/SO.



Window Option for Radome

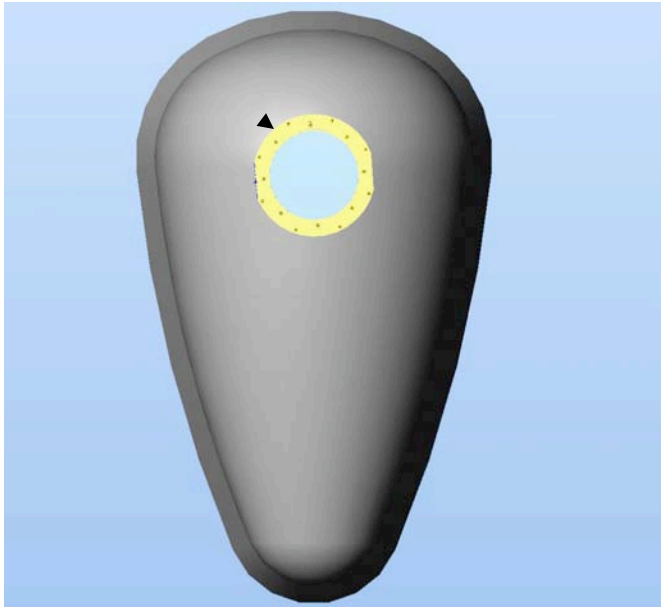
Will allow for large instruments to be used that require optical windows



C-12 Radome model

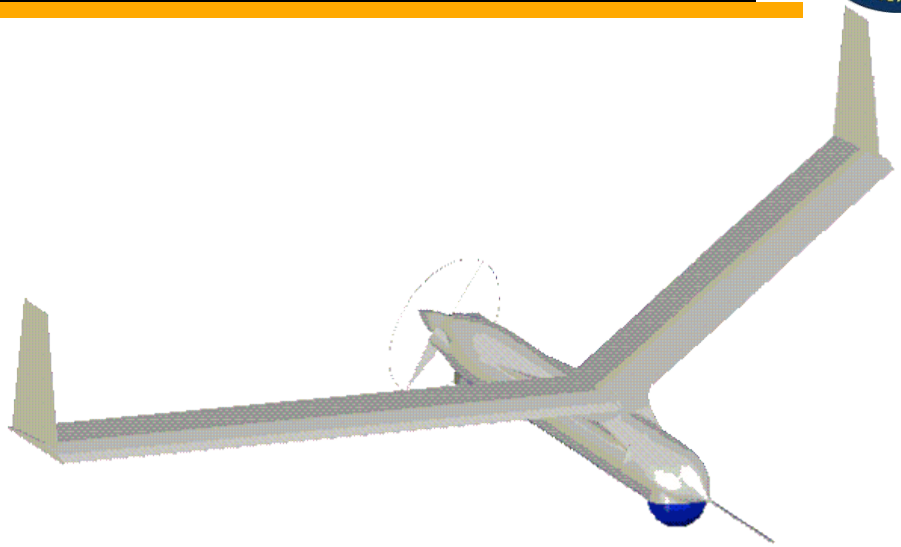
Currently undergoing NAVAIR approval process

Radome with window



Scan Eagle

- Components
  - Airframe
  - Ground Station
  - Launcher
  - Recovery Stand



Scan Eagle Parameters

PERFORMANCE

- Max Horizontal Speed 75 knots
- Cruise Speed 48 knots
- Ceiling 19,500 ft
- Endurance 12+ hours

DIMENSIONS

- Wing Span 10.2 ft
- Fuselage Diameter 7 in
- Length 5 ft

WEIGHTS

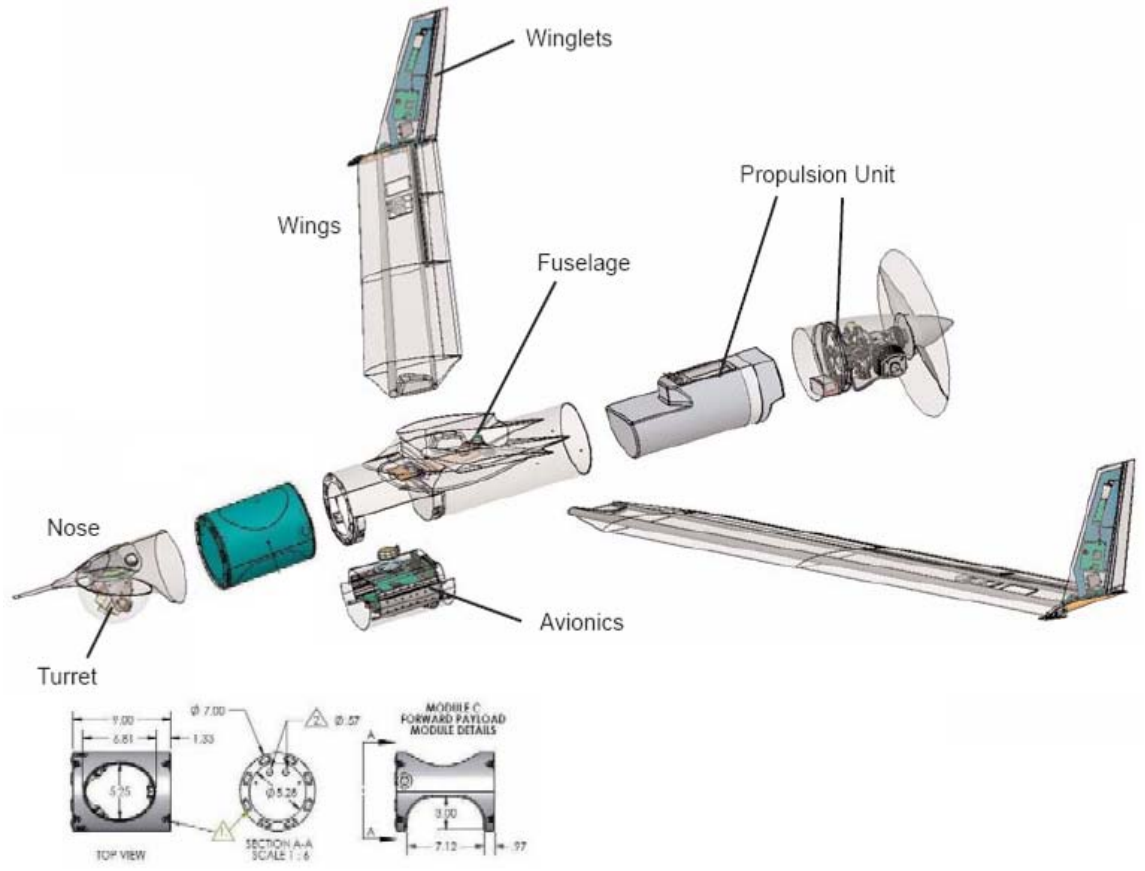
- Empty Weight 28 lb
- Fuel and Payload 15 lb
- Max Fuel 12.1 lb
- Max Takeoff Weight 44 lb

FREQUENCIES (MHz)

- C2/Telemetry: 1350-1390
- Video Downlink: 2300-2500

PAYLOADS

- Sony FCB-EX780 EO Camera
- DRS Tech. E3500 IR Camera



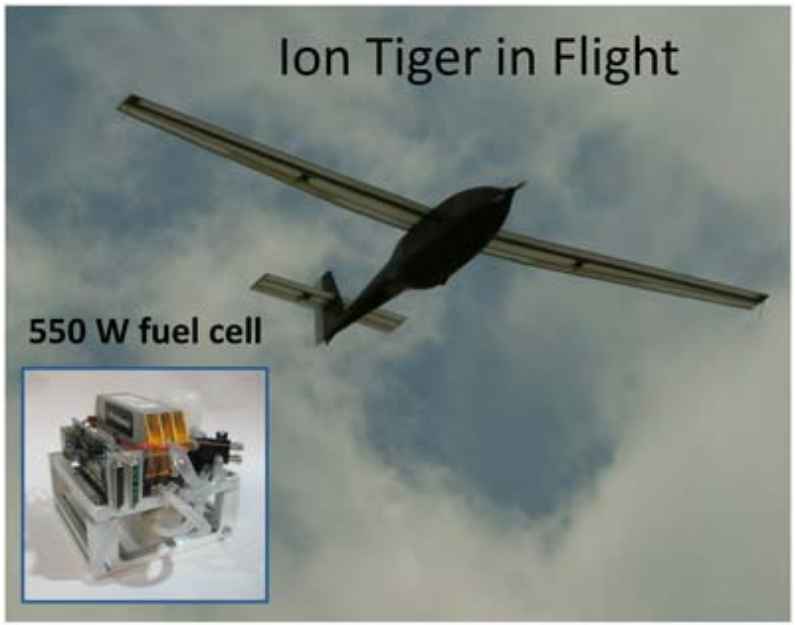
SE UAS has over 100,000 hours of flight time in theater

XFC / Ion Tiger

Hydrogen Fuel Cell technology powers UAV's

XFC conducted endurance tests throughout 2009.

Ion Tiger completes a 23 hour and 17 minute flight in October 2009



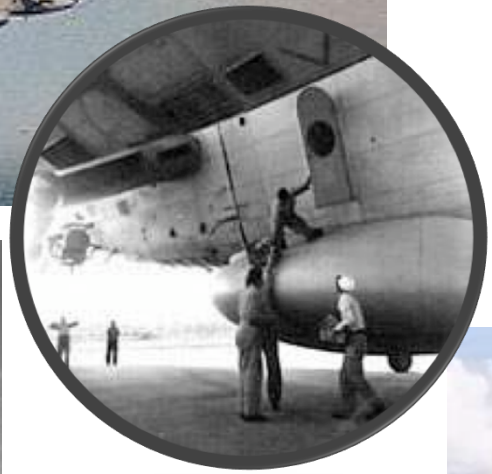
Historical Capabilities

US Navy Operations 1915 - 1962

Early Warning

Convoy escort

SAR



Patrol (ISR)

ASW

Navy needed many persistent maritime patrol platforms to counter the German ASW threat to Allied shipping.

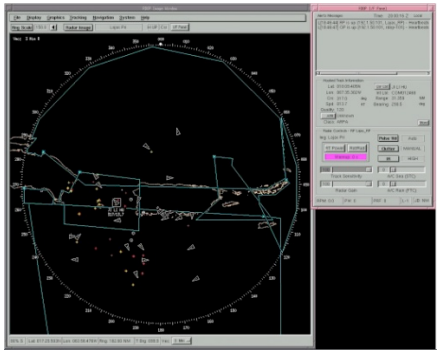
WWII success inspired large airships for Early Warning through 1962.

NRL Embarked Sensors

Skyship 600

Straits of Florida, Summer 2008

- Automatic Identification System (AIS)
- ELINT package
- Surface Search Radar
- EO/IR Camera
- Software Fusion
- Common Datalink



Other Projects

NSA SIGINT Package on MZ-3A (above & below)

ONR Marine Mammal Research

EPA Atmospheric Sensing

ONR Modular Integrated Link Electronics System (MILES)

MZ-3A Status

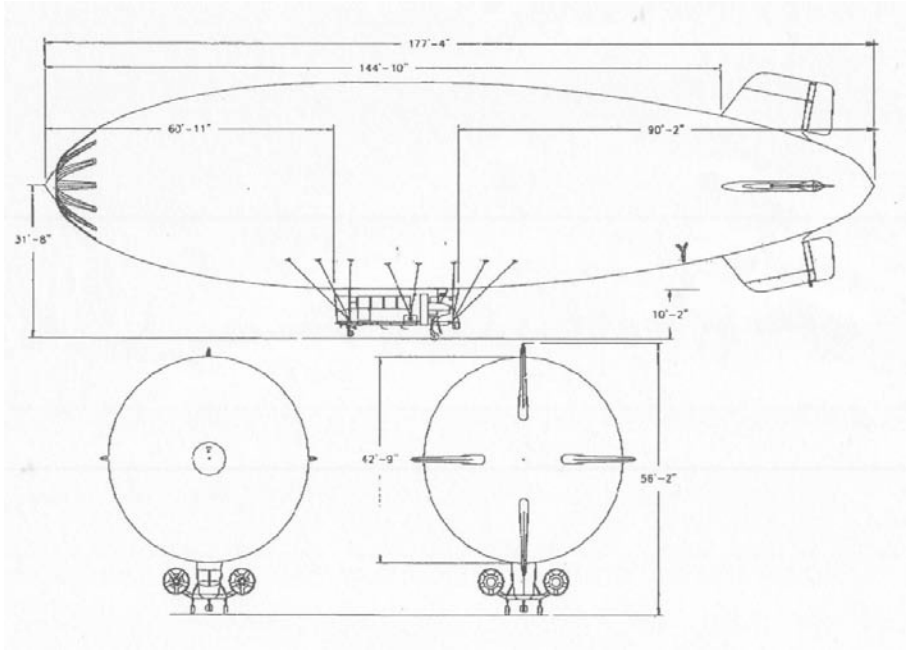
- Navy airship (BUNO 167811)
  - COTS design
  - Envelope built to govt specification
  - American Blimp Company (ABC)
  - A-1-70(G)
- Located at NAES Lakehurst, NJ
- Congressionally funded
- Mission = Advanced Airship Flying Lab
- Contractor operated and maintained
- Active Flight Clearance (May 2010)

MZ-3A Specifications

DIMENSIONS
Length 178 feet
Height 55 feet
Width 46 feet

ENVELOPE
Volume 170,000 ft^3
Length 175.5 feet
Diameter 43 feet
Fineness Ratio 4:1
Ballonet = 26% volume

PERFORMANCE
Max Speed 45 KIAS
Max Altitude 9.5 kft
Fuel Burn @ 30 KIAS = 11 gph
Max ROC/D ~1400fpm/2700fpm



MAIN PROPULSION
2 x 180HP Lycoming IO-360
Prop 65" diameter, 5-blade

CONTROL CAR/GONDOLA
Overall Length 25.5 feet
Overall Width 6 feet
Interior Length 11.4 feet
Interior Height 6.3 feet
Seating: Pilot + 9 passengers

ELECTRICAL POWER
2 x 28 volt, 90 amp alternators
2.2 kw aux power unit

MOORING RADIUS
Fixed Mast 300 feet
Mobile Mast 200 feet

500 lbs		1000 lbs		1500 lbs		2000 lbs		2500 lbs	
Altitude	Endurance	Altitude	Endurance	Altitude	Endurance	Altitude	Endurance	Altitude	Endurance
9.5	12	7.5	12	5.5	12	4.5	12	2	12
NA		8	9.5	6.5	10.4	5	9.7	3.5	9
NA		8.5	8.5	7	7.8	5.5	7.1	4	6.6
NA		9	5.9	7.5	5.3	6	4.6	4.5	3.9
NA		9.5	3.4	8	2.7	6.5	2	5	1.3
kft	hrs	kft	hrs	kft	hrs	kft	hrs	kft	hrs

Note: Figures above assume Standard Day, 99% Helium purity, 2 pilots + 1 crew, no superheat, and 2hr fuel reserve.

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